US 6,559,780 B2

10

With above description, persons skilled in the art are able to implement the present invention. It is to be noted that besides the MPEG video data stream and audio data stream described here, any compressed data stream can use the present invention to improve the efficiency of processing the compressed data stream and reduce error propagation brought by lossy compression methods.

FIG. 8 shows how the present invention applies to the MPEG video data stream. As mentioned above, the compression method of the MPEG video data stream is not only an intra-frame compression but also an inter-frame compression. In other words, there is relationship between MPEG frames, as shown in FIG. 1(E).

When retrieving segments of frames from the compressed data stream and one frame of the segment is compressed by referencing to preceding or succeeding frames, then it is typically necessary to decompress the corresponding reference frames before processing this frame. According to the present invention, the frames to be processed are separated into two groups, as shown in FIG. 8. The frames of the first group 81 are not reference of other frames, and therefore the frames of the first group 81 need not to be decompressed. The frames of the second group 82 are reference of other frames, and therefore the frames of the second group 82 need to be decompressed. By this way, unnecessary decompression is avoided and time is saved. Additionally, unnecessary error propagation of lossy compression is reduced.

It is to be noted that the above embodiments are only used to describe the example of the present invention. For succinctness purpose, functions or operating elements in the present invention system that belong to the prior art may not be described in detail here.

It is to be noted that the present invention may be applied in different forms. For example, users may interact with the system of the invention through any input devices, such as keyboards, mice, light pens, etc. Similarly, the present invention can combine with personal computers, personal digital assistants, notebook computers, mobile phones, digital cameras, etc. These electric devices can be used in any operating systems, such as any version of Windows, Palm OS, MacOS, OS/2, BeOS, Linux, UNIX, etc.

Accordingly, the above disclosure should be construed as limited only by the appended claims.

What is claimed is:

1. A system for processing a source compressed data stream that has a first group of source segments and a second group of source segments, the system comprising:

a first processing unit for selectively modifying a status of said first group of source segments to generate a first group of target segments; and

a second processing unit for performing an operation on said second group of source segments to generate a second group of target segments, the second processing unit comprising:

a decompressing unit for performing a decompression on said second group of source segments to generate a group of decompressed source segments;

an operating unit for performing an operation on said group of decompressed source segments to generate a group of uncompressed target segments; and

a recompressing unit for performing a recompression on said group of uncompressed target segments to generate said second group of target segments.

2. The system of claim 1 further comprising a dispatching unit for separating said source compressed data stream into said first group of source segments and said second group of source segments.

3. The system of claim 1 further comprising an integrating unit for combining said first group of target segments and said second group of target segments to generate a target compressed data stream.

4. The system of claim 1 wherein said status of said first group of source segments comprises a timestamp.

5. The system of claim 1 wherein said second processing unit refers to a parameter data segment while performing said operation.

6. The system of claim 5 wherein said parameter data segment is decompressed from another source compressed data stream.

7. The system of claim 1 wherein said operation is to change said group of decompressed source segments according to a rule.

8. The system of claim 1 wherein said operation is to mix data into said group of decompressed source segments.

9. The system of claim 1 wherein said source compressed data stream is a Moving Picture Experts Group (MPEG) video data stream.

10. The system of claim 1 wherein said source compressed data stream is a Moving Picture Experts Group (MPEG) audio data stream.

11. A method for processing a source compressed data stream comprising the steps of:

separating said source compressed data stream into a first group of source segments and a second group of source segments;

selectively modifying a status of said first group of source segments to generate a first group of target segments; and

performing a manipulation on said second group of source segments, said manipulation comprising steps of:

12

decompressing said second group of source segments to generate a group of decompressed source segments;

performing an operation on said group of decompressed source segments to generate a group of uncompressed target segments; and

performing a compression on said group of uncompressed target segments to generate a second group of target segments.

12. The method of claim 11 further comprising the step of combining said first group of target segments and said second group of target segments to generate a target compressed data stream.

13. The method of claim 11 wherein said status of said first group of source segments comprises a timestamp.

14. The method of claim 11 wherein said operation refers to a parameter data segment.

15. The method of claim 14 wherein said parameter data segment is decompressed from another source compressed data stream.

16. The method of claim 11 wherein said operation is to change said group of decompressed source segments according to a rule.

17. The method of claim 11 wherein said operation is to mix data into said group of decompressed source segments.

18. The method of claim 11 wherein said source compressed data stream is a Moving Picture Experts Group (MPEG) video data stream.

19. The method of claim 11 wherein said source compressed data stream is a Moving Picture Experts Group (MPEG) audio data stream.

* * * * *